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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/447,030	11/22/1999	RAINALD FORBERT	AE97/151US	3281

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EXAMINER

NGUYEN, NGOC YEN M

ART UNIT PAPER NUMBER

1754

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/447,030

Applicant(s)

FORBERT ET AL.

Examiner

Ngoc-Yen M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2003 and January 12, 16, 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on November 25, 2003 has been entered.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-14, 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergna et al (4,131,542) with the Grant and Hackh's Chemical Dictionary and Chemical Engineer's Handbook to show inherent state of fact.

Bergna '542 discloses a process for making amorphous spheroidal silica grains which comprises the steps of:

- (a) spray drying with flowing air at a temperature from 130 to 400°C a silica sol;
- (b) sintering the porous micrograins to reduce the surface area thereof from 5% to 20% (note claim 1).

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Bergna '542 further discloses that the feed in most cases is a silica aquasol (note column 5, lines 46-47).

Bergna '542 discloses that fast heating of the droplets produces a dry skin of silica trapping water inside the hollow spheres (note column 8, lines 8-10). This silica is considered as a hydrogel because such product (note also the structure of product of Bergna '542 in Figure 1) meets the definition of a gel, note that in Grant and Hackh's Chemical Dictionary, "gel" is defined as "colloidal solution of a liquid in a solid", i.e. the solid is a continuous phase and the liquid is a discontinuous phase.

Bergna '542 also discloses that the manner in which spray contacts the drying air is an important factor in spray dryer design, as this has great bearing on dried product properties by influencing droplet behavior during drying. The spray can be directed into the hot air entering from the top of the drying chamber. Product and air pass through the drying in "co-current" flow, so called after the inlet-outlet layout for air, feed, and dried product (note column 7, lines 56-60). Alternatively, the spray can be contacted with air in "counter-current" flow. Spray and air enter at the opposite ends of the dryer. This arrangement offers dryer performance with excellent heat utilization (note column 8, lines 3-6). When spray and air are contacted in counter current flow, either the spray or the air must be flowing against gravity. Thus, the claimed "moving medium flows substantially against the direction of the force of gravity" can be "at once envisaged" from the disclosure of Bergna '542. When the flow of air is fed from the bottom of the dryer, it goes against the direction of gravity and naturally its speed would diminish in the direction of flow.

From the Chemical Engineers' Handbook, for "countercurrent" spray dryer, only one set up is shown, in which hot air is introduced from the bottom and feed is sprayed from the top (note Figure 20-71(a)).

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The process of Bergna '542 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-14, 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergna '542, with Grant and Hackh's Chemical Dictionary and optionally in view of Chemical Engineers' Handbook.

Bergna '542 discloses a process as stated above.

Chemical Engineers' Handbook can be applied to teach for countercurrent spray dryer, the hot air is conventionally introduced from the bottom.

The difference is Bergna '542 does not disclose how the lyosol is formed.

However, the method for making the starting material is given little weight absence a showing of criticality, as the starting material made by any process would be expected to perform the same function in the process. Moreover, the examiner takes Official Notice that it is known in the art to form silica sol by reacting sodium silicate with a mineral acid and using the product of one process as starting material for another process would have been within the skill of the skilled artisan, In re Kamlet 88 USPQ 106.

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Claims 13-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marisic (2,384,946) in view of Fernholz et al (3,939,199) and optionally further in view of Mielke et al (5,656,195).

Marisic '946 discloses a process of producing hydrogel pellets by continuously contacting within an enclosed mixing chamber such as an injector or nozzle mixer, streams of reactant solutions of such concentration and proportions that no gelation occurs within the mixer, but only at some predetermined time after leaving the mixer, and under such conditions of flow that each stream is completely and uniformly dispersed within and throughout the other at the instant of contact. The resultant colloidal solution is ejected from the mixer through an orifice or orifices of suitable size so as to form globules of the solution which are introduced into a fluid medium where the globules of the colloidal solution set to a gel before they pass out of the medium (note page 2, lines 48-64). Pellets may also be formed by a process analogous to spray drying wherein the gelable solution is sprayed into a drying tower (note page 2, left column, lines 68-72). The fluid medium can be constituted of a gas such as air (note sentence bridging the 2 columns on page 2).

Marisic '946 further disclose that the medium may contain components, which can be dissolved therefrom by the hydrosol (note page 1, left column, lines 17-18).

Marisic '946 discloses that the hydrogel can be produced from a solution of sodium silicate and hydrochloric acid (note Example III).

It would have been obvious to one skilled in the art to select any embodiment among the specifically disclosed embodiments, Merck & Co. Inc. v. Biocraft Laboratory Inc. 10 USPQ 1846.

Marisic '946 further discloses that the fluid medium is maintained at a temperature below the boiling point of said sol. After setting is complete, the hydrogen

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may be washed, base exchanged, heat treated or otherwise processed to obtain the desired physical and chemical characteristics in the final product (note page 2, right column, lines 14-40). The resulting gel possesses open pores free of liquid, this product is considered the same as the claimed aerogel.

Marisic does not specifically disclose the temperature of the process, however, it would have been obvious to optimize these process conditions to obtain the best results. It would also have been obvious to dry the hydrogel to obtain aerogel since aerogel is desired in the art.

For the step of converting the hydrogel to aerogel, in the event that the above heat treating step of Marisic '946 is not sufficient to convert the hydrogel to aerogel, Mielke '195 can be applied as stated below.

Mielke '195 teaches that silica aerogel particles are desired to be used in moldings (note claim 1). Mielke '195 further discloses that silica aerogel can be produced by solvent exchange, and subsequent supercritical drying a silica hydrogel.

Thus, it would have been obvious to one of ordinary skill in the art to convert the hydrogel of Marisic to aerogel because aerogel is desired to be used in moldings as suggested by Mielke '195.

The difference is Marisic 946 does not disclose that the fluid is moving substantially against the direction of gravity.

Fernholz '199 discloses that for a spray-drying process for converting a sol to a gel, in order to avoid damage of the gelled and still soft particles, they can be sprayed in upward inclined direction and collected in a liquid bath (for example water) or they can be conducted in countercurrent flow with a current of air or gas which reduces their impact velocity and simultaneously improves their resistance by drying. In this manner particles of almost any desired size can be produced (note column 2, lines 23-33).

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It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a current of air or gas in countercurrent flow with the spray of silica sol in the process of Marisic '946, as suggested by Fernholz '199 because such countercurrent flow of air would reduce the silica gels impact velocity and improve their resistance by drying.

For claim 20, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have used both the water bath and the countercurrent flow of air to avoid damage of the gelled and still soft particles, because combining two or more ways as disclosed in Fernholz '199 for the same purpose has been held to be a prima facie case of obviousness, see *In re Kerkhoven*, 205 USPQ 1069.

It should be noted that the 102 and 103 rejections were reversed in the Board's decision on "procedural grounds", not based on the merits. All the rejections stay the same as in the previous Office action.

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stan Silverman be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.



Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
February 23, 2004